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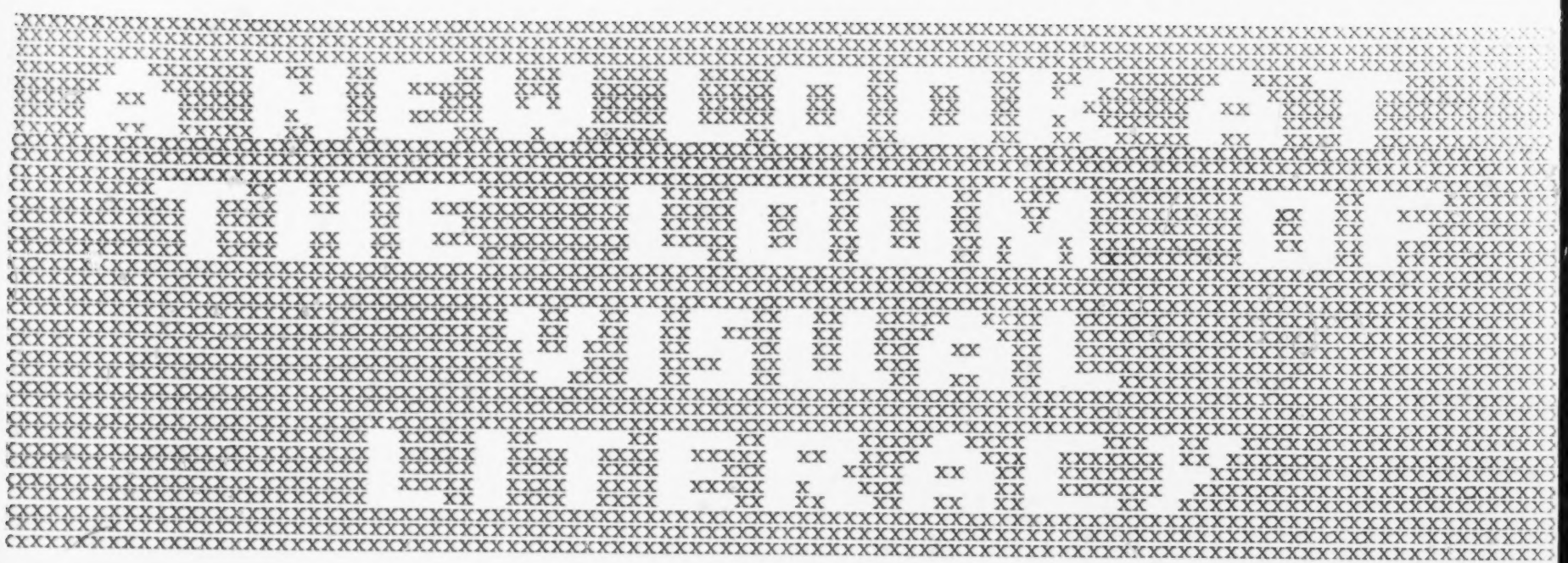
ABSTRACT

Many disciplines, including semantics, linguistics, philosophy, psychology, and the practical arts, have contributed to our knowledge of visual literacy. Insights these disciplines have made about the nature of meaning, art, or perception apply to visual literacy. If, as some studies indicate, some children are visually rather than verbally oriented, training in visual literacy is important for them and for those who wish to reach them. In addition, children who are visually literate may have an easier time becoming verbally literate. Many projects involving photography or filmmaking can encourage visual literacy. In language arts, they can be used to study modes of discourse, the structure of language, and literacy conventions and genres. Social studies and science students can also use them. Scientists and engineers should be encouraged to create visual systems suitable for use in schools. Too often, equipment is used insufficiently because it is too complicated. Better communication between educators and engineers would alleviate this problem. (JK)



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Joint Meeting of the SPSE and the SMPTE

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Tonight we have gathered here to share ideas. We are motion-picture and television engineers, photographic scientists and engineers, audio-visual specialists, and we are educators. Our individual ideas in our respective fields are like threads. This meeting room is like a loom. If we are successful here, our ideas will intertwine in such a way that a story-telling tapestry will be woven. The story our loom weaves into this tapestry may join many of our thoughts about photography, motion pictures, television, and education.

If you went home right now, and looked up the word loom in your Funk and Wagnalls, you would find that it is not just a noun referring to a frame or machine for inter-lacing yearns or threads at right angles. "Loom" is also a verb meaning "to come into appearance, expecially in great form, like a mountain out of the mists." At present, just such a great dim shape is coming into appearance in education. What looms indistinctly in education is a new kind of literacy of the eye -- a kind of visual literacy. But what is visual literacy? What are its parameters? What practical use has visual literacy in the classroom? And, how does visual literacy involve motion-picture, television, and photographic scientists and engineers?

WHAT ARE THE PARAMETERS OF VISUAL LITERACY?

The parameters of visual literacy are perhaps as indistinct as that mountain looming in the mist. If plotted graphically, the parameters of visual literacy might represent the ever-changing shape of an amoeba. Each pseudopod of the amoeba would represent

one of the many disciplines that contribute to growing knowledge about the literacy of our eyes.

Some disciplines directly concerned with the shape of visual literacy are semantics, philosophy, technology, art, graphic arts, developmental and perceptual psychology, linguistics, rhetoric, and programmed learning. Let us examine briefly some of the contributions of these disciplines to our understanding of visual literacy.

We commonly understand the word "literacy" to mean the ability to read and to write. We commonly apply the word "literate" to one who reads with sensitivity and broad understanding and who writes cleverly and clearly. By analogy, we may understand the term "visual literacy" to mean the ability to "read" and "write" using visual tools. Thus, one who is "visually literate" would be able to read visual statements with sensitivity and broad understanding and would be able to write cleverly and clearly using visual media. But how do we learn to "read" and "write" visually.

We begin to learn the use of verbal language by finding out what words mean. As we become increasingly literate, we come to know more words and their ranges of meaning. The study of meaning has become a formal discipline, called "semantics," and has contributed to our knowledge of visual literacy.

SEMANTICS

Some years ago, S. I. Hayakawa edited a book called The Use and Misuse of Language. Hayakawa chose for his book an essay by Paul Wendt called "The Language of Pictures." In it, Professor Wendt stated, "Pictures are a language in themselves. They are not merely representations of reality operating within narrow limits of

expression." He went on to show how the affective connotations of pictures comprise a grammar of photography. Wendt made an important statement when he said, "The meanings of pictures are not in the pictures themselves but rather in what we bring to the pictures."

Martin Dworkin, editor of Studies in Culture and Communication, gave a semantic definition for the word "literacy" at the First National Conference on Visual Literacy. He stated that literacy was the assumption of responsibility for meaning. This definition necessarily encompasses the meanings of visual and verbal statements alike. John L. Debes, III, of Eastman Kodak Company, enforced the same point of view when he said, "In intentional communication about a semantic process one can communicate visually, verbally, or in other ways....." In the classrooms of our schools, we may be encouraged to remember that we take responsibility for visual and verbal messages if we intend to prepare children to cope with contemporary visual sophistication.

In teaching our children, we must be sure to show that words have ranges of meanings which may differ significantly from lexical definitions. Similarly, pictures have ranges of meaning. We may also show that pictures and words semantically interlock when they are used together. For example, an advertisement may show a picture of elegantly-dressed people sitting in a room full of hand-carved, cherry-wood furniture. They may all be drinking cocktails. The words beneath the picture may say, "You were wise to mix your cocktails with our booze!" The message of this ad lies neither in the picture nor in the words alone. The message lies where the meanings of the picture and the meanings of the words overlap. Subtly, the company

may be telling you that you will be considered cultured, refined, and well-to-do if you serve their booze in your home. The unspoken message appeals to your subconscious desires for prestige and wealth. The ad makes you smile gently as you sit on an apple crate in your sleeveless undershirt quaffing a fifteen-cent can of beer.

The case of this message is certainly overstated. However, similar messages carry similar appeals into the minds of visually semi-literate people who are unaware of the semantics of slick communication. By studying the semantics of visual and verbal presentations, and by using still and motion-picture photography in their regular classes, students understand more deeply and respond more wisely to the combined-media messages they encounter every day.

LINGUISTICS

If verbal and visual language are to be learned in parallel fashion, we must look at the study of language. The study of language, per se, has changed very much in the last few decades. Instead of telling us where we will use shall and where we shall use will, contemporary grammarians and linguists are showing us how language is regulated by conventions based upon use and meaning. The contemporary attitude toward language may well have begun with the work of Charles Carpenter Fries, whose structural linguistics concepts paved the way for studying the parallelisms between visual and verbal structure. Fries seemed to embrace the assumption that we understand language better by ascertaining what people say than by telling people what to say.

Fries held that most words in the English language could serve in a variety of grammatical roles, just as we saw the use of

"loom" as both a noun and a verb. In the title of this presentation, "loom" was used as a noun. Grammatically, however, we might have spoken of "loom literacy." In such a case, "loom" would be an adjective modifying "literacy." We might have used the title "loom literacy" to describe a presentation that showed us how to identify and use various parts of a loom. Either use of the word, "loom," would be valid grammatically.

Similar grammatical elements in a sentence or a picture may be inter-changed. In the sentence, "John looked at Harry," we can reverse the positions of the words "John" and "Harry" and preserve the meaning, if the men are looking at each other. The picture of this occurrence is very similar to the sentence describing it. In fact, the structures of many verbal utterances are similar to the structures of visual utterances. Noam Chomsky, a transformational grammarian at M.I.T., has contributed significantly to our knowledge of syntactic structures and has provided the groundwork for computer syntactic approaches to sentences and pictures. Using some of Chomsky's basic tenets, Max B. Clowes has developed computer paradigms whereby both sentences and pictures can be generated. There are numerous other examples whereby the syntax of symbolic verbal language generates pictures, animated films, and other visible language.

Students' visual literacy experiences will encourage them to identify parallelisms between verbal and visual syntax and will give them tools for creating visual/verbal utterances. When students set out to make photographs, slide sequences, one-reel, single concept films and other, longer motion pictures, they will demonstrate practical and theoretical knowledge of verbal and visual syntax.

PHILOSOPHY

Philosophers have concerned themselves with vision and education for many years. Plato valued sight above other senses. In the Republic he makes Socrates refer to sight as the most precious of the senses. In the Timaeus he says that the eyes were created before the other organs of perception and are, therefore, the most important. Later, Berkeley dealt with sight as well. In his Principles of Human Knowledge, George Berkeley said, "Visible ideas are the language whereby the governing spirit, on whom we depend, informs us what tangible ideas he is about to imprint upon us...." This may be the first reference to visual language in the literature of philosophy.

More recently, contemporary philosopher, Colin Murray Turbayne of the University of Rochester, has published his book, The Myth of Metaphor. In this book, Turbayne devotes one chapter to visual language. He says that what we see are only signs of the real things that are visually represented. Here Professor Turbayne draws parallels between visual and verbal models of communication: parallels very similar to those we discussed in relation to syntactic structure. Turbayne suggests that visual illusions and representations can create what we might call visual rhymes, metaphors, and puns.

Perceptual and developmental psychologists have advanced the state of visual literacy considerably. They have not only helped in determining the need for perceptual education, but they have determined to some extent what sort of progress we can reasonably expect from children. James J. Gibson and Donald O. Hebb have laid the

fundamental groundwork. Hebb extablished that the people, objects, and events we perceive through sight may be understood only if we have had other sensory experiences with them. Dr. G. N. Getman, Director of Child Development at the Pathway School which specializes in the habilitation of brain-injured children, concurs. He says, "Vision may well be determined more by all the other information systems than it is by the eye itself."

James J. Gibson has indirectly endorsed the "meaning-centered" approach to the development of visual skills when he said:

> "As a general rule, the individual explores, samples, or scans the sea of energy around him for what this proximal stimulation will specify about its ultimate sources. There are special cases, of course: the human individual can visually scan a picture for its design, but what he is generally in search of is meaning. The esthete may practice discrimination and enjoy the structure of a painting or the composition of music, but this is a sort of perceptual luxury."
>
> (The Senses Considered as Perceptual Systems, Boston, 1966, p. 250.)

As we begin to train the vision of the child, therefore, we will begin by expanding his visual vocabulary, steadily increasing the amount of information the child can grasp with each glance at his surroundings. By studying still photographs he has made, the child will discover new visual elements of his environment that he had not noticed before.

INDUSTRIAL, VOCATIONAL, AND GRAPHIC ARTS

Industrial, vocational, and graphic artists have made their contributions to visual literacy too. Earl C. Kelley, who began his educational career in industrial arts, wrote a valuable book called Education for What is Real. Earl Kelley, along with Albert Einstein, John Dewey, and Hadley Cantril, was interested in the work

of Adelbert Ames. He was so interested that he devoted the contents of Education for What is Real to Ames' work. This was fortunate in that Ames never wrote a book about his own experiments and findings.

Ames experimented with representative and illusory perceptions. He is reported to have established several generalizations which are:

1. Everything that exists outside the skin of an individual can be known only as it is filtered through the human nervous system.

2. What we perceive is largely a function of what we have formerly experienced, what we assume, and what our needs and purposes might be.

3. We will change our perceptions, but usually not until we have experienced failure and frustration from relying on our accustomed perceptions.

4. Since each person perceives uniquely, communication is possible only when similar experiences, assumptions, and purposes are at its base.

5. Perception is largely a function of the linguistic categories that can be drawn upon by the perceiver, for through these categories the perceiver systematizes his experiences.

6. The meaning of our perceptions is reflected in what we DO as a result of perceiving.
   (See Postman & Weingartner, Teaching As A Subversive Activity.)

In reporting on these findings of Ames, Kelley suggests applications that would change our understanding of the term "education." Kelley suggests that we teach children to understand the nature of their perceptions, and the manner in which these perceptions of the individual affect the nature, scope, and flexibility of his knowledge. Through visual literacy experiences, utilizing real-world things and picture surrogates for them, children learn both what is in the world and how we come to know what is in the world.

Another person in industrial and graphic arts to make a significant contribution to visual literacy is Dr. Richard Erickson of Purdue University. Erickson has experimented with sensory preferences in learning. He has discovered that some people prefer to learn through the visual mode. Others, called "haptics," prefer to learn through their sense of touch. Still others are impartial to the mode through which they learn. They may learn through sight, touch, hearing, or other perceptual channels equally well. But Erickson raises a profound question. "How many students are visual or haptic, but are not in programs which accommodate their special learning needs?" Unless we begin to employ visual and verbal and other channels for discovery, students who rely heavily upon one sensory modality may never have school programs suited to their needs.

ART

Visual literacy draws heavily on the field of art. Rudolph Arnheim has encouraged bridging the gap between experimental and humanistic traditions in psychology. His book, Toward A Psychology of Art, systematically examines psychological elements in architecture, dance, literature, and cinematography. By accommodating Adelbert Ames' observation that communication is possible only when similar experiences, assumptions, and purposes are at its base, Arnheim is able to give us fundamental approaches for finding threads of universal experiences which weave the human condition.

Jurgen Ruesch and Weldon Kees have given us a substantial vocabulary for talking about the elements of visual communication in their book, Nonverbal Communication. They coined such expressions as

"action language," "object language," and "symbols" as the three main elements of visual 'talk.' By "action language," which we commonly refer to as "body English," Ruesch and Kees meant the intentional gestures and body postures and movements we use to communicate. By "object language," they referred to a subtler concept. A chain and lock on the playground fence may tell us that we are not permitted to enter at a particular time. These objects speak as clearly as words. Consequently, they occupy a place in the visual vocabulary that we function with every day. If body and object language are equivalents of verbal talk, then photographs or movies using these elements of visual vocabulary are the visual equivalent of written words.

If the theory is correct that a visual vocabulary precedes a verbal one, then it might be argued that strengthening the visual vocabulary would have the consequence of strengthening the chances of a proper development of a verbal vocabulary. One hypothesis is that strengthening the visual vocabulary increases the inclination of a child to talk, and may loosen the tongue of those disinclined to talk at all.

WHAT PRACTICAL USE HAS VISUAL LITERACY IN THE CLASSROOM?

Photography and cinematography are two of the practical aspects of visual literacy implementation in the classroom. But how can we use photography and cinematography to increase perception and expand avenues for discovery? What sort of hardware, film, processing and other stuff must we inject into the school budget to get visual literacy rolling? How can we justify new expenditures to school boards and taxpayers? Must we re-educate teachers to use these new

techniques? Will the rest of the child's studies suffer if we adopt visual literacy? Don't we have to wait for many more technical innovations before we can use these theories? Let us proceed through this array of disheartening questions to see if there are any hopeful and optimistic answers.

HOW CAN WE USE PHOTOGRAPHY AND CINEMATOGRAPHY TO INCREASE PERCEPTION AND EXPAND AVENUES FOR DISCOVERY?

When we take steps to integrate photography and cinematography into the curriculum, we may be encouraged to remember that these are effective tools for recording and reporting and discovery, but they are not the only tolls that can be so used. Visual literacy experiences through photography and cinematography will enhance rather than subordinate or eliminate other methods of discovery and disclosure. Thus, the teacher can plan one or two units during the year that will use visuals as student projects. This keeps the planning time as well as the cost to a minimum.

The language arts teacher may wish to have students create visual presentations in narrative, descriptive, expository, or pursuasive exercises. The students may use existing processes or imagined experiences as the subjects of their visual/verbal studies. In many cases, students may use still or movie cameras that are available in their homes. Parents may be encouraged to provide a roll of film and processing for this aspect of the child's studies.

When students create slide talks or slide-tape presentations, they are stimulated to write complementary verbal material for the visuals they have made. Sometimes schools see fit to create an instructional materials center where student-made units are deposited for borrowing and use by other classes. This makes programs even

more economical, because the student-made learning units are useful to other classes and individuals for a variety of purposes. Even if the students use their own still and movie cameras, film, and processing, there will be materials and pieces of equipment that the school may wish to have on hand to enrich visual literacy learning experiences.

Students creating learning packages for history or social studies classes may wish to use photographic images that cannot be made without a copy camera. Some students may wish to cue their visuals to a sound recording. The school may, therefore, supply copy cameras, tape recorders, and sound synchronizers. The school will also find great use for easy-to-operate slide and movie projection equipment. The simpler the design of the equipment, the better. If students will be working individually on various projects in each classroom, the school may wish to have several high-intensity reflectance daylight screens. This will permit students to work with their projected images in rooms where other students have to participate in other activities at the same time.

Science students may explore the microcosm by taking pictures through the microscope with their simple cameras. For this, filter adapters for the simple cameras must be made available. In macrophotography, they may wish to make pictures using close-up lenses for simple cameras. These and filter adapters may be provided at a very low cost.

By storing additional equipment and supplies in an instructional materials center, schools make possible the uses of photography and cinematography in diverse curricula. The curricular

applications of visual literacy experiences are limited only by the creativity of the teachers. Photo-sequences and movies may be used in language arts classes to study modes of discourse, the structure of language, rhetorical and literary conventions and genres, as well as drama and cinema as formal disciplines. Social studies students may use visual media to study local history, urbanization, social stratification, and demography as well as the usually visual units on geography. Science students may reveal secrets of nature through time-lapse photography, photomicrography, and macro-photography, in addition to recording the visible elements of their experiments.

Thus, our school-age children will learn to "read" visuals with skill, to write with visuals expressing themselves effectively, to know the grammar and syntax of visual language and be able to apply them, to be familiar with the tools of visual literacy and their use, to appreciate the masterworks of visual literacy, and to be able to translate from visual language to verbal language and vice versa.

HOW DOES VISUAL LITERACY INVOLVE PHOTOGRAPHIC, MOTION-PICTURE, AND TELEVISION SCIENTISTS AND ENGINEERS?

Certain avenues of cooperation between educators and engineers of visual media make themselves readily apparent. Probably the foremost aspect of cooperation relates to the rapid growth of scientific and engineering technology. Scientists and engineers of visual media work to keep abreast of changes and innovations in their respective fields. Often, however, much time elapses between the announcement of a technical accomplishment and popular dissemination of that announcement among technical readers. Much more time is

required to translate that knowledge into terms that can be understood by the layman. Necessarily, the educator cannot keep abreast of both technical and educational advances. Consequently, photographic, motion-picture, and television engineers are encouraged to disseminate announcements of advances made in their fields. This must be done in a way that is understandable to and interesting for the educator. Where it is possible, this may be accomplished by inviting educators to participate in the events of the Society of Motion-Picture and Television Engineers, the Society of Photographic Scientists and Engineers, and other scientific organizations. In some cases, societies for scientists and engineers may wish to cooperate with professional and scholarly organizations in education. Moreover, relationships must be developed between technological innovators and educators to permit and encourage free interchange of ideas and attitudes. "Communication is possible only when similar experiences, assumptions, and purposes are at its base."

Secondly, photographic, motion-picture, and television scientists and engineers may strive to create visual systems -- whether photographic or motion-picture or television or any combination of these -- that are suitable for use by students and teachers in educational settings. We have seen the disaster of placing millions of dollars worth of visual equipment in schools to gather dust on shelves or serve only a very few useful moments in any instructional week. Much of this results from a lack of compatibility among photographic, motion-picture, and television equipment and systems. A large part of this is also in the complexity of individual pieces of equipment. What is available must be simplified. What is useful

must be interchangeable and compatible. This is not to say that we have not made advances in this direction, for the television industry currently profits from rapid processing systems for motion pictures, from high resolution rear-projection for slides, and from many other fruits of the labor of creative engineering. But we have much work to do for education.

Thirdly, we must remember that those who deal daily with the laughter and tears of children reason differently from those whose daily bread is won with measurements and tests, with designing and drafting. If in the cooperation between educators and engineers misunderstanding arises out of dissimilar experiences, assumptions and purposes, we may estend ourselves to create mutual experiences to serve as the basis for new understanding. If we cannot see the other's point of view through our eyes or through reason, let us say (with King Lear), "I see it feelingly." Thus, we can work together toward the achievement of more complete literacy. Our loom of visual literacy will whirr and hum.

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